ALFRED-WEGENER-INSTITUT
HELMHOLTZ-ZENTRUM FÜR POLAR- UND MEERESFORSCHUNG

FIELAX

Surface T/S Data RV "Heincke"

HE487

Data Processing Report

Contents

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1 Introduction

This report describes the processing of raw data acquired by the thermosalinograph on board RV "Heincke" during expedition HE487 to receive cleaned up and drift corrected salinity data.

2 Workflow

The different steps of processing are visualized in Figure 1. Unvalidated data of sensor, internal and external temperature are extracted from the DAVIS SHIP data base (https://dship.awi.de) in a 1-second interval. The Salinity was calculated by applying the Practical Salinity Scale 1978 (PSS-78). Furthermore the sound velocity was derived by using the Del Grosso equation.
As a first step, a basic cleanup was performed to remove missing or flagged data. Then, too low flow rates are taken as indicator for an unproper usage of the thermosalinograph. Since the salinity measurements in coastal areas (e.g. rivers and ports) are less reliable, measurements in a buffer of 2 nautical miles (NM) along the coast are filtered. In the norwegian area (fjords) the buffer is set to 200 meters (0.108 NM). After the exclusion of data outside the speed interval of 0.5 kn to 15 kn, the salinity is driftcorrected with lab calibration data. After despiking, a visual screening is performed to enhance the data quality. In the last step the temporal resolution is reduced to 5-minutes-means.

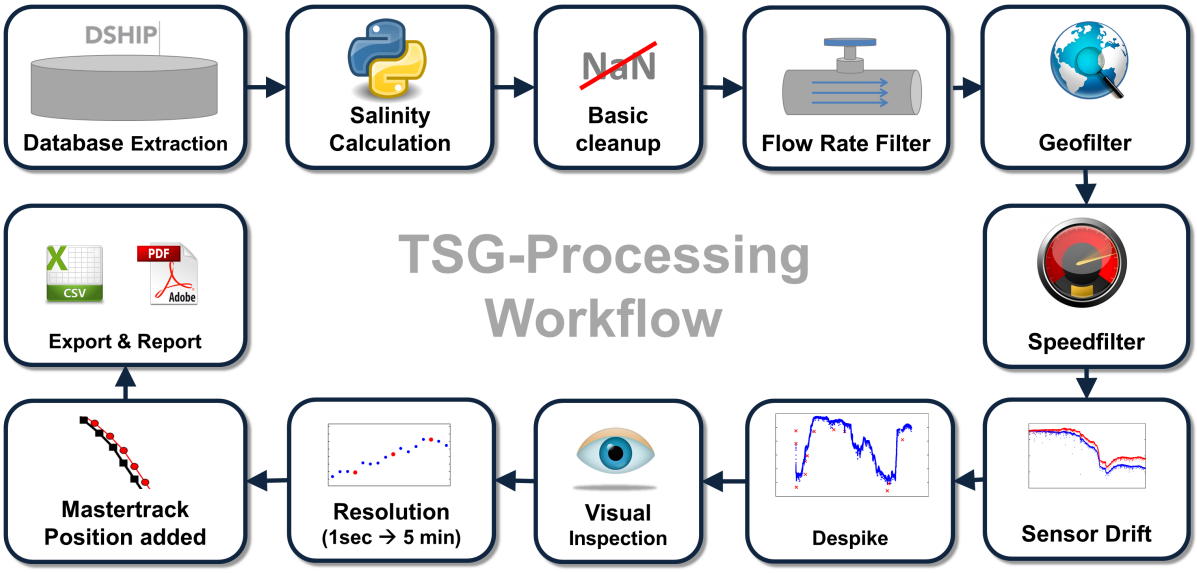

Figure 1: Workflow of TSG data processing

3 Cruise details

Vessel name	RV "Heincke"
Cruise name	HE487
Cruise start	18.05.2017 Bremerhaven
Cruise end	21.05.2017 Bremerhaven
Cruise duration	4 days

4 Sensor

Thermosalinograph:	Seabird SEACAT SBE21 (SN: 3333)
External Temperature:	SBE38

5 Processing Report

Database Extraction

Data source	DSHIP database (dship.awi.de)
Exported values	345600
First dataset	2017-05-18T00:00:00 UTC
Last dataset	2017-05-21T23:59:59 UTC

Automatic Validation

The following thresholds were applied for the automatic flagging of the position data:

Min. flow rate	Minimum 2.5
Min. speed	Minimum 0.5 kn between two datapoints.
Max. speed	Maximum 40 kn between two datapoints.
GeoBuffer	0.1080 NM around Norway, 2 NM anywhere else

Flagging result

Filter	Data left (abs.)	Data left (rel.)	Data removed (abs.)	Data removed (rel.)
Raw data	345600	100 %	—	—
Basic	0	0.00 %	345600	100.00 %
Flow rate	—	—	—	—
Geo	—	—	—	—
Speed	—	—	—	—
Despike	—	—	—	—
Manual	—	—	—	—
5-min-Mean	—	—	—	—

Sensordrift

Last calibration	—
Current calibration	—
Start of deployment	—
End of deployment	—
Scaled drift	—
Minimal offset	— [PSU]
Maximal offset	— [PSU]

Comments

Sensor No. 3333 exchange ahead from schedule due to broken conductivity cell. No reasonable post cruise calibration possible.

Process evolution

There is no salinity data to be visualized.

Result file

Processing Report (HE487_TSG.pdf):
This PDF document.